

# Application of DRG Index in Evaluation of Specialized Medical Service

Xiong Chen, Shengmei Chen, Conghui Wang, Chunqi Ai\*

Department of Medical Science, Hubei University of Medicine, Shiyan, Hubei, China

## ABSTRACT

The traditional indicators and DRG indicators were used to evaluate the medical services in the mental health center and the sleep department of our hospital, to understand the status quo of the medical services in the three dimensions of medical service capacity, efficiency and safety, as well as the evaluation results of the traditional indicators and DRG indicators in the two ward areas of our hospital. In addition, the hospitalization time and hospitalization cost of the two wards of mental health center and sleep department were analyzed, as well as the factors affecting the hospitalization time and hospitalization cost in DRG grouping conditions. Analysis of traditional indicators and DRG indicators in the evaluation of medical service quality, from the angle of multidimensional data the department of medical service present situation, provide the basis for department improve medical efficiency and effectiveness, as DRG index is used to guide the scientific basis for early management of department, to DRG related index for medical service management, implement of fine management for hospital, improve the level of medical services.

### KEYWORDS

DRG, Medical services, Evaluation, Application

\*Corresponding Author:

Chunqi Ai, Department of Medical Science, Hubei University of Medicine, Shiyan, Hubei, China.

E-mail: xlwszx@taihehospital.com

How to Cite This Article:

Chen X, Chen S, Ai C, et al. Application of DRG Index in Evaluation of Specialized Medical Service. *J Evid Based Med Healthc* 2022;9(10):38.

Received: 04-Apr-2022,

Manuscript No: JEBMH-22-55180;

Editor assigned: 06-Apr-2022,

PreQC No. JEBMH-22-55180 (PQ);

Reviewed: 20-Apr-2022,

QC No. JEBMH-22-55180;

Revised: 02-Jun-2022,

Manuscript No. JEBMH-22-55180 (R);

Published: 14-Jun-2022,

DOI: 10.18410/jebmh/2022/09.10.38.

Copyright © 2022 Chen X, et al. This is an open access article distributed under Creative Commons Attribution License [Attribution 4.0 International (CC BY 4.0)]

## INTRODUCTION

DRGS is currently recognized as the most advanced medical payment method, and its application plays a crucial role in hospital strategic planning, discipline construction, medical quality and cost control, performance appraisal and talent training, and reducing the burden of common people's medical services. Diagnosis Related Groups (DRGs) are divided into several Groups for management according to the age, Diagnosis, complications, complications, treatment methods, severity of disease and other factors. The DRGS system can establish the weight system and evaluation index covering the whole disease species on the basis of case grouping, including: breadth index (number of DRGS grouping), Overall technical difficulty index (CMI value, average technical difficulty) 3 workload of doctors (weight of discharged cases), Cost consumption index time consumption index. It is not difficult to see that DRG is a good management evaluation tool. Through the analysis of various indicators in medical records, it can carry out fine management on the capacity dimension, quality dimension and operation dimension of the hospital. At present, the research on medical service cost more, but from the point of existing research, generally limited to isolated study of medical service cost prediction and optimization control, a certain problem, not to look at from the perspective of overall medical service cost management this problem, at the same time, the existing methods and theory to the study of DRG oriented medical service cost management's support is not enough. Therefore, the evaluation of specialized medical services by using traditional indicators and DRG indicators can make a considerable evaluation of specialized medical service capabilities, construct a performance evaluation system of the department, realize fine management of the department and provide reference for improving the level of medical services.

### Research Background

**Further improvement of medical quality management requirements:** With the development of society and economy, the people living standard rise, lifestyle changes and accelerate the ageing process, people have higher demands for medical quality, department as the basic unit of providing medical services to patients, the diagnosis and treatment links directly related to the quality of the hospital overall quality level, and the effectiveness of quality management determines the overall medical quality management level.<sup>1</sup>

**National policies encourage the use of DRG tools:** In 2016, several opinions of the leading group of deepening medical and health system reform of the state council on further promoting the experience of deepening medical and health system reform further proposed to comprehensively promote the reform of payment mode and encourage payment mode based on DRG disease diagnosis.<sup>2</sup> This series of documents fully shows China's current emphasis on DRG and the necessity of using DRG for medical service evaluation.

**Overseas research status of DRG:** The United States, the United Kingdom, Germany, Australia and many Asian countries are all using DRG. The United States is the research and development country, while other countries are improving and innovating based on the introduction of American DRG and adapting to their own health characteristics.<sup>3,4</sup> In the research of various countries, there are mainly three aspects: the grouping method of DRG, the application effect of DRG and the existing problems of DRG. In recent years, countries have also explored the application of DRG as an evaluation index in hospital management, medical quality management and control.<sup>5</sup> DRG has become the main mechanism for most developed countries to compensate for hospital medical services.<sup>6</sup>

### Research Significance

Based on the analysis of the research status, it can be seen that under the background that the people's requirements for medical quality are further improved, the national health department has formulated relevant policies to further promote the application of DRG in medical service evaluation, requiring hospitals to further improve medical service and realize sustainable development. Therefore, how to make scientific use of DRG index for medical service evaluation to understand the medical operation of departments, guide clinical departments to improve the quality and efficiency of medical service, and enable hospitals to achieve fine management.<sup>7-9</sup>

## LITERATURE REVIEW

### Research Methods

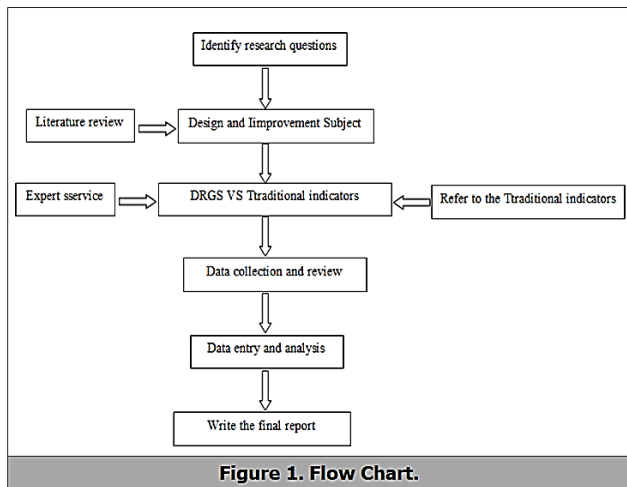
**Research objects:** Choose our mental health center, sleep two units as investigation object, according to the theoretical framework of DRG and traditional indicators from three dimensions (ability, efficiency, security), a total of 10 indexes (four traditional indicators, DRG indicators 6 respectively to collect the whole year 2018 discharged patients medical record home page data and data platform DRG grouping data.<sup>3</sup>

**Literature review:** Take "DRG", "medical service" and "evaluation" as key words or subject words and conduct literature retrieval in CNKI, wanfang, CBM and other databases. Collect relevant laws, regulations and policy documents related to DRG performance evaluation and hospital management from some authoritative official websites. This paper systematically reviews the establishment, utilization and research results of DRG at home and abroad, and summarizes the methods involved in the evaluation of hospital medical services by DRG indicators.<sup>4</sup>

### Data Collection

Collect our mental health center, sleep two ward in 2018, the year a total of 636 hospitalized patients with related

medical record information, medical record home page version information of the Beijing DRG grouping device (2016), after collection contains traditional index (the number of hospital, on average, all costs of such confinement, mortality) and DRG index (total weight, number of sets of CMI, DRG, consumption time consumption index, cost index, low risk of mortality) index data, a total of 10 medical services (Figure 1).



**Quality Control**

The scientific nature and feasibility of the research scheme were discussed by systematically consulting literatures and consulting relevant peer experts. To modify and improve the research program based on expert opinions. Data collation, input and analysis stage again check, effectively ensure the authenticity and reliability of data.<sup>5</sup>

**Ethical Issues**

This research adheres to the principle of confidentiality.

The personal information of the data objects of medical records will not be leaked, and the data results are limited to this study.

Ward	Medical service capacity	Ability composite index	Efficiency of medical service		Efficiency composite index	Safety of medical services		Composite index	Composite index ranking
	Number of hospitalized		Average of inpatient days	Average cost per trip		Adverse event rate (%)			
Mental health center	879	1.14 (1.14)	14.36 (1.04)	15407.5	0.83 (0.80)	0.49	1.35 (1.35)	1.2	1
Sleep ward	735 (0.96)	0.96	17.28 (0.95)	13009.4 1.06	1.18	0.81 (0.83)	0.83	1	2

**Table 1. Medical Service Performance Evaluation Results of Mental Health Centre and Sleep Department According to Traditional Indicators in 2018.**

**Note:** In parentheses are the index values after the indexation. The forward index is calculated by the formula of actual value / standard value, while the negative index is calculated by the formula of standard value / actual value. In the traditional index, the number of hospitalized patients was positive, the average length of stay, the average cost per time and the rate of adverse events were Negative. The standard values of traditional indicators Where: The mean values of the two disease areas,

**RESULTS**

**Comparison of Medical Service Evaluation Results between Traditional Indicators and DRG Indicators**

Mental health center and sleep department use traditional indicators to evaluate medical services (Table 1). Average number of hospitalized, all expenses, such confinement, plants situation is: department of mental health center, sleep a ward, ward two medical services with traditional indexes evaluation results are shown in Table 1, mental health center ranked the first, second, sleep with the highest number of mental health center hospital ward, all costs, lower average such confinement. The average length of stay and the incidence of adverse events in the sleep ward were higher. Under the evaluation of traditional indicators, the comprehensive index of medical service capacity and the comprehensive index of medical service safety, the mental health center is better than the sleep department, but the medical service efficiency index of sleep department is higher than the mental health center, the comprehensive index of mental health center ranks the first, the sleep department ranks the second. The results of performance evaluation by GRGS in the mental health center and the sleep department are shown in Table 2. The total weight of mental health center and the number of CMI and DRG groups were higher than that of sleep department. Time consumption index was lower in mental health centers than in sleep centers mental health centers cost more than sleep centers. The composite index of medical service safety was 0 in all three wards. Comprehensive index ranking, mental health center ward ranked first, sleep division ranked second. The results of the above two kinds of comprehensive evaluation show that the evaluation results of DRGS and traditional indicators are consistent.<sup>6-9</sup>

respectively: 807, 15.82, and 14208.43 and 0.65. The composite index is multiplied by the same category, and then the three dimensions are weighted by 0.6, 0.2 and 0.2 respectively. Finally, the method of heterogeneous addition is adopted to calculate. The higher the composite index is, the better the evaluation result of the medical service in the ward is, and vice versa.

Ward	Medical service capacity		Ability composite index	Efficiency of medical service		Efficiency composite index	Safety of medical services	Safety	Composite index	Composite index ranking	
	Total weight	CMI DRG	group number	Time CI	Cost CI		Low risk Mortality rate (%)				
Mental health center	2230.5	1.101	25	1.21	1.09	1.67	0.81	0	0	0.97	1
Sleep ward	1686.5	0.983	18	0.87	1.23	1.13	1.22	0	0	0.75	2
	(1.17)	(1.09)	(1.02)	(0.93)	(0.81)			(0.00)			
	(0.96)	(0.97)	(0.87)	(1.01)	(1.22)			(0.00)			

Note: the total weight, CMI and DRG groups are all positive indicators, while the time consumption index, cost consumption index and low - risk mortality rate are all negative indicators. The DRGS index standard value was the mean value of the two disease areas, which were 1958.47, 1.042, 21.5, 1.16 and 1.4, respectively. The score calculation method was as shown in Table 1.

**Table 2. Medical Service Performance Evaluation Results of Mental Health Center and Sleep Department According to Drg Indicators in 2018.**

**DISCUSSION**

**Feasibility Analysis of the Application of DRG Index in Medical Service Evaluation**

Advantages of DRG indicators applied to health service evaluation. DRGS is an internationally recognized tool for maintaining the clinical homogeneity of the case portfolio. The introduction of the concept of DRGS in the evaluation of medical services can accurately reflect the medical services of medical institutions from a multidimensional perspective through the objective information easily obtained and the indicators with a small but rich amount of information, which has advantages in professional classification, weight system, benchmark management and other aspects. The application of DRGS in medical performance evaluation is feasible and scientific to a certain extent. On the one hand, it has certain advantages in professional classification, benchmark management and weight system. On the other hand, DRGS has been promoted in China for many years, and relevant policies and supporting tools have been gradually improved, laying a foundation for DRGS index to carry out hospital medical service price. However, the application time of DRGS in China is shorter than that of traditional indicators, which requires further in - depth discussion and practice.

**DRG Index is applied to the Analysis of Medical Service Capacity, Medical Service Efficiency and Medical Service Safety**

The results of this paper preliminarily show that the comprehensive evaluation results of medical service evaluation by traditional indicators and DRGS indicators are consistent, and different dimensions are different. Based on disease species differences, DRGS index pays more attention to the evaluation of "quality" of medical services, which is applicable to the comparison of medical services between medical units and can objectively reflect the current situation of internal medical services in hospital departments. Therefore, it is more comprehensive to combine DRGS index with traditional index to evaluate department medical service. According to the comprehensive evaluation results of DRGS indicators in this paper, the mental health center has the best performance. In terms of medical service safety, while the efficiency of Medical service still needs to be improved. Mental health centers and sleep units should further strengthen the control of hospitalization costs and length of stay. To further promote the evaluation of DRGS medical service, it

is necessary to further improve the quality of the first page data of medical records according to the actual development situation, promote the further maturity of DRGS grouping device, promote the optimization and development of DRGS, and use the DRGS tool to guide medical institutions to improve the level of medical service.

**CONCLUSION**

In our study, According to the literature review, the medical service evaluation of DRGS application in most hospitals is still in the experimental stage, with no systematic DRGS evaluation and assessment mechanism formed, and it is not yet linked to department assessment, resulting in the fact that this effective medical quality management tool has not yet fully played its role. Relevant management departments of the hospital should further improve the DRGS evaluation system and include it into the department performance assessment. On the one hand, it can improve the enthusiasm and consciousness of medical staff to fill in the front page of medical records, so as to improve the quality of medical records data. On the other hand, it can also guide departments to improve the level of medical services. DRGS index evaluation is a process of gradual improvement. It should first be piloted in the department group of the hospital and then gradually promoted to the whole hospital.

**Recommendations**

**Recommendations of DRG index for research hospitals:** Enhance the quality of hospital medical record homepage information strengthens the medical staff medical record homepage and DRG knowledge related training. The main purpose of DRGS is to facilitate the payment of hospital expenses and at the same time to provide a convenient tool for hospitals to evaluate medical services. The code base of surgical operation that can meet the needs of hospital development and clinical application should be constantly improved, and the code base of disease diagnosis should be unified, which is the difficulty and focus in the application of DRGS in hospitals. In addition, the establishment of a comprehensive and diversified information quality control system, and constantly improve, strengthen and innovate the management of the quality of the first page of medical

records, and the continuous training of the actual operating ability and professional skills of the coding staff, can provide more adequate guarantee for the full implementation of DRGS. In practical work, the doctor write electronic disease duration, there are some filled out disease diagnosis is not standard, the main complication of incomplete or diagnosis contents such as conditions, resulting in DRGS grouping problem occurs, for example, may divide the critically ill patients of higher cost of hospitalization and low cost of the average patient. Therefore, it is necessary and urgent to popularize the knowledge of classification and coding of diseases to clinicians and improve the writing quality of medical records. At the same time, the knowledge related to the application of DRGS index in performance evaluation should also be further popularized among medical personnel, which is conducive to strengthening the normative awareness of medical personnel in filling in the first page of medical records.

### Recommendations of DRG Index for Research Departments

Improve medical and health services, balance the development of disease areas, and strengthen the construction of specialties and sub - disciplines. Mental health center and sleep should through the DRGS evaluation results, from the ability of medical service, efficiency, and security to improve the medical service level, in terms of medical service ability, mental health center ward should maintain its advantage in the psychology major disease diagnosis and treatment ability, on the one hand, ward sleep also strive to increase the number of treated patients, on the other hand also to diagnosis and treatment center of gravity should be more focused on sleep NanZhiBing, number of diagnosis and treatment with and without complications, to increases the technical level of the hospital mental health specialist. In terms of the efficiency of medical services, the mental health center ward and the sleep ward should be compared and studied, and effective measures should be taken to control the length of patients' hospital stay, so as to further improve the efficiency of specialized services. While carrying out new technologies and maintaining high - quality medical services, all ward areas should pay attention to the strict control of costs and minimize the burden of patient's medical expenses. In terms of medical service safety, this department is a department of internal medicine, and most of the diseases are diseases of internal medicine diagnosis and treatment, with low risk and mortality. Therefore, it is necessary to strengthen the learning and practice of doctor - patient communication and etiquette knowledge, so as to ensure the safety of patients and improve the medical service level of the department. To strengthen the construction of specialties and sub - disciplines, the research hospital is not only a comprehensive hospital, but also a regional medical center in northwest Hubei. The mental health center of our hospital, as a key specialty of the hospital, has a number of achievements, while the medical service, as a provincial specialty evaluation project, is of great significance to the overall planning of sub - discipline construction, personnel training, specialty team construction, scientific research and the development of new technology. As large comprehensive hospital, the medical service function orientation, the focus should be difficult diagnosis and

treatment, DRGS for this provides a good support for the development of key discipline, able to focus on the construction of the specialized advantage and make up the shortfall to provide more scientific guidance, strengthen the internal management department, equilibrium under the big subjects each ward development, plan as a whole and the discipline construction, to lay a certain foundation for the realization of the hospital of fine management.

### Inadequacy

From the previous communication with hospital managers, it can be known that there are many problems and difficulties in the management and control of the medical service level in clinical departments. In the past two years, the research on DRG in China has mainly focused on the evaluation of medical service performance in clinical departments from the perspective of DRG indicators, and few of them have been applied to the evaluation of internal medical service in clinical departments. In this study, DRG was used as an evaluation indicator in the evaluation of department medical services, and the current medical situation of clinical departments was studied and analyzed comprehensively and comprehensively, laying a preliminary foundation for the application of DRG indicator evaluation to guide clinical departments to improve medical quality in the later period. It provides reference for hospitals to realize fine management and improve medical service level. Due to time, manpower, funds and other reasons, this research was limited to one department of our hospital and could not be conducted in other departments or hospitals. Therefore, the research results and conclusions can only represent the situation of the investigated hospital. The development time of DRGS in China is still short, and the application of DRGS in index evaluation is also in the exploration stage in China. So the indicators and evaluation methods selected by this research institute still need to be further practiced and explored in the later period.

### Acknowledgments

Authors wishing to acknowledge assistance or encouragement from colleagues, special work by technical staff or financial support from organizations should do so in an unnumbered Acknowledgments section immediately following the last numbered section of the paper.

### REFERENCES

1. Liu Y, Wang JT, Zhao Y. Exploration on improving the efficiency and quality of medical service based on DRGs. *Chi J Hospt Manage* 2016;32(11):823-825.
2. Wu GH. Disease quality management and disease payment method. Beijing: people's medical publishing house 2009;13.
3. Yang M, WQ. Cluster analysis of DRG research hotspots in China since the new medical reform. *Health eco res* 2019;(08):35-41.
4. Cong LX, Wang HY, Jin CL. Experience and inspiration of innovative medical technology payment in the United States. *Health Eco Res* 2019;36(07):10-13.
5. Yan XC, Yao JW, Lu J, et al. Research on the application of DRG in the evaluation of hierarchical diagnosis and treatment system. *Gansu Medicine*

2019;38(03):269-271.

6. Atilla E, Kilic P, Gurman G. Cellular therapies: day by day, all the way. *Transfusion and Apheresis Science*. 2018;57(2):187-96. [CrossRef] [GoogleScholar] [Indexed]
7. Silbert S, Yanik GA, Shuman AG. How should we determine the value of CAR T-cell therapy?. *AMA Journal of Ethics* 2019;21(10):844-851. [CrossRef] [GoogleScholar][Indexed]
8. Clemmons A. The hematopoietic cell transplant pharmacist: A call to action. *Pharmacy*. 2020 Jan 2;8(1):3. [CrossRef][GoogleScholar][Indexed]
9. Handgretinger R, Doring M. Neoplastic Hematologic Disorders in Children and Adolescents. In *Concise Guide to Hematology* 2019:423-461. [GoogleScholar]